wherein the upper and lower principal surfaces have a small waviness Wa of no greater than 0.5 nm.

REMARKS

Please reconsider this application in view of the claim amendment made above and the following remarks.

Applicant notes that page 2 of the IDS filed October 29, 2001 was not returned. Applicant hereby requests that page 2 be returned, and if it has not been considered, requests consideration, initialization, and return.

I. Disposition of Claims

Claims 1-8 are currently pending in the instant application. Per a restriction requirement, claims 1-8, directed to a product, were elected for continued prosecution without traverse. Accordingly, Applicant notes that box 4a of the Office Action Summary should list claims 9-20 as being withdrawn from consideration.

The inventorship of the elected claims (claims 1-8) is the same as those of the original claims (claims 1-20).

Claim 1 has been amended to clarify the scope of the present invention. No new matter has been added by way of the amendment. Support for amended claim 1 may be found, for example, on page 2 of the Patent Application Publication, paragraph 22, and on page 3 of the Patent Application Publication, paragraph 49, of the instant application.

Claim 4 has been cancelled as the claim has been combined with claim 1.

II. Rejections Under 35 U.S.C. § 112, first paragraph

The present invention relates to a molded glass substrate for a magnetic disk. In one embodiment, the molded glass substrate (page 3 of the Patent Application Publication, paragraph 49) is produced by the precise press-molding method described in the specification. The mirror surface property of a molding die is transcribed onto the principal surfaces, and the outer surface is a molding-free face in the mirror finished state.

Claim 4, now combined with claim 1, was rejected in the Office Action, under 35 U.S.C. § 112, first paragraph, as not providing reasonable enablement of small waviness Wa.

Small waviness Wa has been clearly defined (page 2 of the Patent Application Publication, paragraph 38) as the measurement of the principal surface at four locations within 1 mm^2 using an interferometer. The measurement of small waviness Wa is the same as average surface roughness (page 2 of the Patent Application Publication, paragraph 37); however, measurement points are located within 1 mm^2 for small waviness Wa versus 10 μm^2 for average surface roughness. Accordingly, one of ordinary skill in the art will understand the measurement of small waviness Wa. Furthermore, small waviness Wa is an indicator of how smooth (*i.e.*, non-rough) the molded glass substrate is over a larger area than the average surface roughness Ra measurement. Also, a small value for small waviness Wa (page 2 of the Patent Application Publication, paragraph 22) is a factor in preventing accidents, such as a crash, even if the disk rotates at high speed.

The measurement of average surface roughness Ra is well known in the art. Average surface roughness Ra is measured over a bounded area. Small waviness Wa is the same measurement as average surface roughness Ra over a larger bounded area. Accordingly, small

waviness Wa is supported by the instant application as originally filed. Withdrawal of the § 112 rejection of claim 4, now combined with claim 1, on this ground is respectfully requested.

III. Rejections Under 35 U.S.C. § 102

Claims 1-4, 6-8 were rejected as being unpatentable under 35 U.S.C. § 102 over U.S. Patent No. 6,383,404 B1 (the '404 patent) issued to Sakai *et al.* To the extent that the rejection still applies to the amended claims, the rejection is respectfully traversed.

As noted above, the present invention relates to a molded glass substrate (page 3 of the Patent Application Publication, paragraph 49) produced by the precise press-molding method described in the specification. The mirror surface property of a molding die is transcribed onto the principal surfaces, and the outer surface is a molding-free face in the mirror finished state. Accordingly, molding the glass material into a glass substrate provides a product with a specified average surface roughness Ra over a larger section of the molded glass substrate than other methods (*e.g.*, grinding and polishing a glass substrate) as described in the '404 patent. [Because a larger area of the molded glass substrate has a small average surface roughness Ra, small waviness Wa provides a measure of the average surface roughness over the larger area.]

As amended, claim 1 recites that the upper and lower principal surfaces have a small waviness Wa of no greater than 0.5 nm.

The Applicant notes that small waviness Wa is *not* an inherent property dependent on average surface roughness Ra, maximum height Ry, thickness, and diameter. Small waviness Wa provides a measure of the average surface roughness over a 1 mm^2 area which is useful in light of the improved average surface roughness of the product produced by the precise press-molding method. Properties such as average surface roughness Ra, maximum height Ry,

thickness, and diameter may overlap in both the '404 patent and the instant application without having overlapping small waviness Wa values.

The fact that a certain result or characteristic *may* occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'"

In the '404 patent (column 5, lines 61-67), Figure 1 illustrates the surface roughness on the principle surface of the glass substrate obtained according to the invention as measured by use of an interatomic force microscope. Furthermore, Figure 2 represents measurements on a specified linear line on the surface illustrated in Figure 1. As can be seen in Figure 1, a 5 μm by 5 μm area is shown with Ra = 1.30 and Rmax = 12.15. In Figure 2, the surface roughness is illustrated for a 5 μm line. Small waviness Wa is a measure of average surface roughness over an area 40,000 times larger.

Furthermore, claim 1 recites that a molded glass substrate for a magnetic disk comprises an outer surface joining the upper and lower principal surfaces, wherein the outer surface is a molding-free face.

The '404 patent (column 14, lines 61-62) discloses an outer surface ground by a relatively rough diamond grindstone to obtain the glass substrate having a diameter of 66 mm. The instant application (page 2 of the Patent Application Publication, paragraph 21) details an observable difference between a molding-free face and a polished surface. Polishing leaves fine

marks whereas a mold-free face is smooth. Accordingly, a difference in the product results from the difference in process.

Advantages of the present invention include reducing industrial waste products and reducing a cost of manufacture because a precision molding process is used. A glass substrate (page 1 of the Patent Application Publication, paragraph 8) is manufactured with a small number of steps to reduce industrial waste. A low cost is achieved by reducing manufacturing processes of the substrate with precision molding. Furthermore, the present invention (page 1 of the Patent Application Publication, paragraph 11) allows the outer circumference to be formed as a molding-free face, so that the surface property equivalent to that of a polished surface can be provided. This makes it possible to suppress the generation of dust from the glass itself and eliminate the need for chamfering.

The '404 patent is silent as to small waviness Wa, and illustrates features that are inconsistent with a small waviness Wa no greater than 0.5 nm. The '404 patent discloses a ground outer surface which produces a product inconsistent with claim 1 of the present invention. In view of the above, the '404 patent fails to show or suggest the present invention as recited in claim 1. Thus, claim 1 as amended is patentable over the '404 patent. Dependent claims are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

IV. Rejections Under 35 U.S.C. § 103(a)

Claim 5 stands rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 6,383,404 B1 (the '404 patent) issued to Sakai *et al.* in view of U.S. Patent No. 6,277,465 B1 (the '465 patent) issued to Watanabe *et al.* Claim 1 has been amended in this reply to clarify the

present invention. To the extent that this rejection may still apply, the rejection is respectfully traversed.

Claim 1 recites that a molded glass substrate for a magnetic disk comprises an outer surface joining the upper and lower principal surfaces, wherein the outer surface is a molding-free face.

The '404 patent (column 14, lines 61-62) discloses an outer surface ground by a relatively rough diamond grindstone to obtain the glass substrate having a diameter of 66 mm. The '465 patent (column 3, lines 29-30) discloses a glass substrate cut into a disc-shape having a diameter of 96 mm. Furthermore, the '465 patent (column 3, lines 32-34) discloses a glass substrate ground by a relatively rough diamond grindstone to obtain the glass substrate having a diameter of 96 mm. The instant application (page 2 of the Patent Application Publication, paragraph 21) details an observable difference between a molding-free face and a polished surface. Polishing leaves fine marks whereas a mold-free face is smooth. Accordingly, a difference in the product results from the difference in process.

As amended, claim 1 recites that the upper and lower principal surfaces have a small waviness Wa of no greater than 0.5 nm. Both the '404 patent and the '465 patent fail are silent with respect to small waviness Wa.

As noted above, the present invention advantageously reduces industrial waste products and reduces the cost of manufacture because a precision molding process is used and the outer circumference is formed as a molding-free face.

In view of the above, the '404 patent in view of the '465 patent fails to show or suggest the present invention as recited in claim 1 as amended. Thus, claim 1 is patentable over the '404

patent in view of the '465 patent. Dependent claims are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

V. Conclusion

The Applicant believes this application to be patentable over the prior art, and respectfully requests favorable action in the form of a Notice of Allowance. If this belief is incorrect, or other issues arise, do not hesitate to contact the undersigned or his associates at the telephone number listed below.

Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference No. 04558.053001).

Respectfully Submitted,

Date: 12/5/02

45,925
Jeffrey S. Bergman
For: Jonathan P. Osha, Reg. No. 33,986
Rosenthal & Osha L.L.P.
1221 McKinney St., Suite 2800
Houston, TX 77010
Telephone: (713) 228-8600
Facsimile: (713) 228-8778

38728_1.DOC

APPENDIX A: MARKED-UP COPY OF THE CLAIMS

1. (Amended) A molded glass substrate for a magnetic disk comprising:

upper and lower principal surfaces formed by molding between precision planar processing members;

an outer surface joining the upper and lower principal surfaces, wherein the outer surface is a molding-free face; and

an inner surface joining the upper and lower principal surfaces, the inner surface defining a through-hole in a central portion of the substrate[.],

wherein a mirror surface property of a molding die is transcribed onto the upper and lower principal surfaces, and an outer diameter satisfies a desired dimensional tolerance by selecting a predetermined volume of a glass material,

wherein a thickness of the molded glass substrate satisfies a desired dimension and tolerance by adjusting a barrel die size, and

wherein the upper and lower principal surfaces have a small waviness Wa of no greater than 0.5 nm.